

CRMX™ available as OEM

CRMX represents the future of wireless DMX & RDM distribution. CRMX stands for Cognitive Radio Multiplexer. It is the first automated and adaptive wireless technology specifically tailored for the lighting industry. CRMX is available on an OEM basis for manufacturers to integrate into fixtures, controllers, and any other DMX/RDM enabled device. Fixtures and controllers with CRMX OEM integrated will be fully compatible with other CRMX DMX/RDM products such as CRMX Nova™ and CRMX Outdoor™. LumenRadio can also assist manufacturers in RDM-enabling any DMX devices through the integration of CRMX OEM modules.



Key CRMX innovations and advantages are:

- 1. Automated Cognitive Coexistence.** CRMX wireless transmissions never disturb, or are disturbed by, other wireless equipment. This fully automated feature offers unrivaled convenience and peace of mind during operation.
- 2. Fidelity.** The DMX frame output is identical to the frame input.
- 3. Error correction.** Advanced algorithms recreate corrupt or lost radio packets.
- 4. Compliance.** Non-compliant DMX is corrected to meet the DMX512-A standard.
- 5. Synchronization.** Precision timing mechanism guarantees synchronized frame delivery.
- 6. Latency.** Industry best; below 5ms in multi-universe systems.
- 7. Compatible with CRMX SuperNova.** All that is needed to manage and monitor RDM systems.
- 8. Security.** 128 bit encryption ensures no hacker interference.
- 9. Legacy support.** CRMX receivers are compatible with legacy W-DMX™ systems.
- 10. Upgradeable.** Software and firmware readily available from our distributors or from our website.

CRMX OEM comes in five different models:

White 5.8 GHz - Available Summer 2010

Dual band enabler. Enables Black and Green OEM cards to use 5.8/2.4 GHz dual band communication.

Black RDM Flex 2.4 GHz - Available May 2010

Can be configured by user as:

1. RDM & DMX Transmitter
2. RDM & DMX Receiver
3. RDM & DMX Repeater

RDM transmitter uses SuperNova for RDM control and feedback. CRMX SuperNova available as RDM controller for free.

Black RDM 2.4 GHz - Available now

RDM & DMX Receiver.

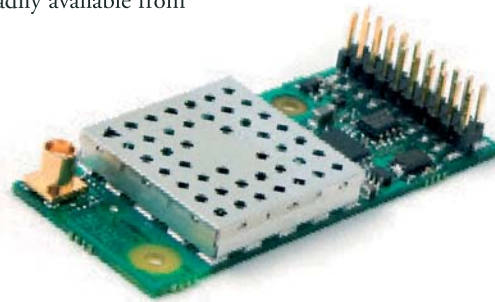
Green DMX Flex 2.4 GHz - Available now

Can be configured by user as:

1. DMX Transmitter
2. DMX Receiver

Green DMX 2.4 GHz - Available now

DMX receiver.



Color coded PCBs provide easy identification of OEM product lines.

Automated Cognitive Coexistence explained:

Wireless DMX distribution systems operate on the same license free frequencies as W-LAN, ZigBee, Bluetooth, some wireless intercoms, etc. Interference between such systems has been a growing problem in the industry with no available solution. CRMX is the first system to continuously scan the radio spectrum and dynamically adapt its frequency hopping patterns. This eliminates interference and maximizes performance of all radio systems in the same radio frequency sphere. In short, it's a smart radio that adapts.

Fidelity and Error Correction explained:

DMX/RDM fidelity and error correction ensures that DMX/RDM frames retain the exact same content and properties, including timing parameters, throughout the transmission process. This is important as many systems now employ moving lights, media servers, LEDs; devices that can severely misbehave if they receive DMX frames that in any way are fragmented or corrupt.

Synchronization explained:

Synchronization guarantees that the DMX frames are delivered by all receivers at exactly the same time regardless of their location and the presence of other radio systems. This is for example critical to maintain uniformity during color changes in large area LED installations controlled by multiple receivers.

RDM Controller explained:

RDM, officially known as "ANSI/ESTA E1.20, Entertainment Technology - Remote Device Management over USITT DMX512" is a bi-directional extension of DMX that allows control and monitoring of RDM devices from an RDM Controller. CRMX RDM products ship with LumenRadio's RDM Controller that allows easy setup, management, and monitoring of even the most complex RDM enabled system. LumenRadio's RDM Controller requires a computer provided by the user. The software is free of charge and the latest version is always downloadable from www.crmxnova.com.

CRMX™ for OEM Sale

	CRMX OEM White 5.8 GHz	CRMX OEM Black RDM Flex 2.4 GHz	CRMX OEM Black RDM 2.4 GHz	CRMX OEM Green DMX Flex 2.4 GHz	CRMX OEM Green DMX 2.4 GHz
Supported protocols					
USITT DMX-512 (1986 & 1990) and DMX 512-A	Same as Black/Green	Yes	Yes	Yes	Yes
RDM ANSI E1.20	Same as Black/Green	Yes	Yes	No	No
Firmware upgrade	Same as Black/Green	Multiple options	Multiple options	Multiple options	Multiple options

DMX interface					
Number of universes supported	Same as Black/Green	1	1	1	1
Full DMX fidelity and frame integrity	Same as Black/Green	Yes ¹	Yes	Yes	Yes
Error correction and packet recovery	Same as Black/Green	Yes	Yes	Yes	Yes
Frame synchronization	Same as Black/Green	Less than 0,01 ms	Less than 0,01 ms	Less than 0,01 ms	Less than 0,01 ms
End-to-end DMX latency	Same as Black/Green	Less than 5 ms ¹	Less than 5 ms	Less than 5 ms	Less than 5 ms
Auto sensing of DMX frame rate and frame size	Same as Black/Green	Yes	Yes	Yes	Yes
Supported DMX frame rates	Same as Black/Green	1 - 830 Hz ² / 0,8 - 7352 Hz	1 - 830 Hz ²	1 - 830 Hz ² / 0,8 - 7352 Hz	1 - 830 Hz ²
Number of DMX channels supported	Same as Black/Green	0 – 512	0 – 512	0 – 512	0 – 512
Loss of DMX input behavior	Same as Black/Green	DMX driver output will go into high impedance state in receiving and repeating mode. Timeout after 1,25s in transmitting mode	DMX driver output will go into high impedance state	DMX driver output will go into high impedance state in receiving mode. Timeout after 1,25s in transmitting mode	DMX driver output will go into high impedance state
W-DMX™ Compatibility	Same as Black/Green	Yes, in receive mode	No	Yes, in receive mode	Yes

Power					
Low voltage input	5 or 7-12VDC / 6W max	5 or 7-12VDC / 3W max	5 or 7-12VDC / 1,2W max	5 or 7-12VDC / 3W max	5 or 7-12VDC / 1,2W max

RF characteristics					
Modes of operation	Same as Black/Green	Transmitter / Receiver / Repeater	Receiver	Transmitter / Receiver	Receiver
Automated Cognitive Coexistence	Yes	Yes	Yes	Yes	Yes
Dynamic adaptive frequency hopping	Yes	Yes	Yes	Yes	Yes
Recoverable Radio Packet Error Rate	30%	30%	30%	30%	30%
Operational frequency range	5744-5822MHz	2402-2480MHz	2402-2480MHz	2402-2480MHz	2402-2480MHz
RF output in high power mode	1000mW (30dBm)	300mW (25dBm) ³	300mW (25dBm) ³	300mW (25dBm) ³	300mW (25dBm) ³
RF output in normal power mode	300mW (20dBm)	100mW (20dBm)	100mW (20dBm)	100mW (20dBm)	100mW (20dBm)
RF output in low power mode	126mW (21dBm) or 32mW (15dBm)	50mW (17dBm) or 10mW (10dBm)	50mW (17dBm) or 10mW (10dBm)	50mW (17dBm) or 10mW (10dBm)	50mW (17dBm) or 10mW (10dBm)
RF modulation	GFSK	GFSK	GFSK	GFSK	GFSK
Sensitivity at 0.1% Packet Error Rate	-96dBm	-96dBm	-96dBm	-96dBm	-96dBm
Tested link range (Normal power mode using standard antennas in urban area)	1000m	500m	500m	500m	500m
Recovery time upon loss of signal	Less than 1s	Less than 1s	Less than 1s	Less than 1s	Less than 1s

Approvals					
FCC: 15.247&68 Class B; Canada ICES 003	Summer 2010	Yes	Yes	Yes	Yes
CE; EN 301 489-1; EN 301 489-17; EN 300-328-1; EN 300-328-2; EN 609 50	Summer 2010	Yes	Yes	Yes	Yes
SRRC (China)	Summer 2010	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁴
ARIB STD T-66 (Japan)	Summer 2010	Yes ⁴	Yes ⁴	Yes ⁴	Yes ⁴

Environment					
Operating temperature range (ambient)	-20°C to +70°C -4°F to 158°F	-20°C to +70°C -4°F to 158°F	-20°C to +70°C -4°F to 158°F	-20°C to +70°C -4°F to 158°F	-20°C to +70°C -4°F to 158°F
Humidity	0-90% non-condensing	0-90% non-condensing	0-90% non-condensing	0-90% non-condensing	0-90% non-condensing

Physical					
Dimensions (W x H x D) not including antennas	27,5 x 12 x 65 mm 1.1" x 0.47" x 2.6"	27,5 x 12 x 65 mm 1.1" x 0.47" x 2.6"	27,5 x 12 x 65 mm 1.1" x 0.47" x 2.6"	27,5 x 12 x 65 mm 1.1" x 0.47" x 2.6"	27,5 x 12 x 65 mm 1.1" x 0.47" x 2.6"
Weight	10g / 0.35oz	10g / 0.35oz	10g / 0.35oz	10g / 0.35oz	10g / 0.35oz

Connectors					
Antenna connector	MCX	MCX	MCX	MCX	MCX
Integral antenna option	Yes	Yes	Yes	Yes	Yes
DC and data connector	Standard 2,54 x 2,54mm (0.1 x 0.1") 2 x 10 position header	Standard 2,54 x 2,54mm (0.1 x 0.1") 2 x 10 position header	Standard 2,54 x 2,54mm (0.1 x 0.1") 2 x 10 position header	Standard 2,54 x 2,54mm (0.1 x 0.1") 2 x 10 position header	Standard 2,54 x 2,54mm (0.1 x 0.1") 2 x 10 position header

¹ Not in repeater mode

² Limited by DMX512-A Standard

³ Allowed in North America only

⁴ Pending